

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2004/003288

International filing date (day/month/year)  
29.07.2004

Priority date (day/month/year)  
29.07.2003

International Patent Classification (IPC) or both national classification and IPC  
G01N29/02, G01N29/24, G10K11/18, G10K11/00, B06B3/04

Applicant  
UNIVERSITY OF WARWICK

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2004/003288

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2004/003288

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**Box No. II    Priority**

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1. ☒ The following document has not been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).  
☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. V    Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	3-17,19
	No: Claims	1,2,18,20
Inventive step (IS)	Yes: Claims	10-12
	No: Claims	1-9,13-20
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations

see separate sheet

**Re Item V.**

**1. Cited documents**

The following documents are referred to in this communication:

- D1: BUIOCHI F ET AL: "Measurement of viscosity using wave mode conversion" ULTRASONICS SYMPOSIUM, 1998. PROCEEDINGS., 1998 IEEE SENDAI, JAPAN 5-8 OCT. 1998, PISCATAWAY, NJ, USA, IEEE, US, 5 October 1998 (1998-10-05), pages 1193-1196, XP010331183 ISBN: 0-7803-4095-7
- D2: BUIOCHI F ET AL: "Ultrasonic measurement of viscosity of liquids" IEEE ULTRASONICS SYMPOSIUM 2000, vol. 1, 22 October 2000 (2000-10-22), pages 525-528, XP010541648
- D3: DE 197 25 012 C (BROSE FAHRZEUGTEILE) 5 November 1998 (1998-11-05)
- D4: US-A-3 720 098 (DIXON N) 13 March 1973 (1973-03-13)
- D5: US-A-4 556 813 (BAUMOEL JOSEPH) 3 December 1985 (1985-12-03)

**2. Novelty and Inventive Step (Art. 33(2)(3) PCT)**

**Claim 1:**

Claim 1 do not appear to fulfill the requirements of the PCT set out in Article 33(2) with respect to novelty:

D1, which is considered to represent the most relevant state of the art, discloses a liquid viscosity sensor (abstract, D1) comprising an ultrasonic source, a sampling body and an ultrasonic receiver (fig. 1 and page 1194, left-hand column, paragraphs 3 and 4, D1), the sampling body including a sampling face contactable by a sample of liquid (fig. 1 and page 1194, left-hand column, paragraph 3, D1), in use, the source being operable to generate a longitudinal ultrasonic wave which follows a path through the body to the sampling face and onwards to the receiver (fig. 1, D1), wherein the body is configured such that the longitudinal wave emanating from the source is transformed into a horizontally polarised shear wave

prior to reaching the sampling face, and the horizontally polarised shear wave is re-transformed (fig. 1 and page 1194, left-hand column, paragraph, paragraph 3, D1).

Therefore, **claim 1 is not novel.**

**Claim 20:**

It appears that the **above objections to claim 1 equally apply, mutatis mutandis, to the corresponding method claim 20.**

Therefore, **claim 20 is not novel.**

**Objections against novelty of claims 1 and 20 could have also been raised on the basis of document D2. Objections against an inventive step could have been raised on the basis of documents D3 and D4.**

**Dependent claims:**

The dependent claims 2-9, 13-19 appear to relate to mere design modifications, consequential features, conventional features or features already present in the arrangement of D1 to D5 and, therefore, do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect to novelty or an inventive step, for the following reasons:

**claim 2 not novel:** see "oblique face", fig. 1, D1.

**claims 3 - 6 not inventive:** see 50, 51, fig. 2, D5.

**claims 13-16 not inventive:** see "PMMA", fig. 1, D1.

**claims 9, 17 and 19 not inventive:** conventional features.

**claim 18 not novel:** see fig. 2, D1.

**3. Clarity (Art. 6 PCT)**

Claims 7 and 8 appear to claim subject matter that is contradictory to the description (see page 5, lines 12-14 and lines 30-31, description) and therefore are unclear.

It is emphasized that unclear subject matter cannot form the basis for novelty and/or an inventive step.

**4. Miscellaneous**

- a. The prior art D1 to D5 is not identified in the description and the relevant background art disclosed therein not briefly discussed (Rule 5.1a(ii) PCT).
- b. The independent claims 1 and 20 are not in the two-part form (Rule 6.3(b) PCT) with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- c. The features of the claims are not provided with reference signs placed in parentheses to increase the intelligibility of the claims (Rule 6.2(b) PCT).